CLAIMS

1. Method for reading by optical interference a bar code extending in the depth of a substrate, the bar code being represented by an area with marks in the substrate partly transparent for electromagnetic radiation, characterized by illuminating the substrate with short coherence length light from a broad band light source, dividing the light into reference and measurement light, returning reference light and measurement light backscattered or reflected in the marking area into an analytical unit, determining the backscattering power or reflectivity of the substrate for all layer depths in the marking area from the interference of the reference and measuring light and interpreting the result as a bar code.

2. Method according to claim 1, characterized in that the superimposing of reference and measurement light in the analytical unit produces a spatial interference pattern, whose light intensity distribution is measured with a detection unit within the analytical unit, and that an evaluating unit determines therefrom the depth-dependent scattering power of the substrate.

3. Method according to claim 1, characterized in that after superimposing reference and measurement light with a spectrometer located in the analytical unit a spatial, spectrally resolved intensity distribution is produced, which is measured with a detection unit within the analytical unit, and that an evaluating unit determines therefrom the depth-dependent scattering power of the substrate.

4. Method according to one of the preceding claims, characterized in that the division of the light into reference and measuring light takes place by means of a beam splitter, which deflects the reference light onto a mirror.

5. Method according to one of the claims 1 to 3, characterized in that the division of the light into reference and measurement light takes place by partial reflection of the illuminating light in a preselected plane in the optical path of the illuminating light directed onto the specimen.

6. Method according to claim 5, characterized in that the preselected plane is part of the substrate, particularly its surface.

7. Method according to one of the preceding claims, characterized in that the light is invisible IR light.

8. Method according to claim 7, characterized in that the frequency spectrum of the illuminating light is such that a substrate non-transparent for visible light is at least partly transparent for the illuminating light.

9. Device for performing the method according to claim 1, characterized by a broad band light source, an optical arrangement for illuminating the substrate means for dividing the illuminating light into reference and measuring light, an analytical unit comprising a detection unit for light and means for returning measurement and reference light from the substrate into the analytical unit, a computer-assisted evaluating unit for processing the measurement data from the analytical unit and a transcription unit interpreting the result of the evaluating unit as a bar code and preparing it for digital processing.

10. Device according to claim 9, characterized in that the detection unit comprises juxtaposed photosensitive elements, which generate electric signals proportional to the incident light intensity.